With kind regards

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ON THE MORTALITY AFTER OPERATIONS FOR STRANGULATED HERNIA; THE TREATMENT OF GANGRENOUS INTESTINE, AND THE RADICAL CURE OF HERNIA.

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It may be remembered that in April and May last (1893), under the headings of "Treatment of Gangrenous Hernia" and "Mortality After Operation for Strangulated Hernia," first reports of what was said at a meeting of the Medical and Chirurgical Society of London appeared in the *Lancet* for April 8th, and then a letter followed in the same journal for May 20th. I give the particular references: "Resection of Intestine and Immediate Suture in Cases of Gangrenous Hernia," by Mr. Kendal Franks, *Lancet*, 1893, vol. i. p. 794, and "The Mortality After Operation for Strangulated Hernia," by Mr. Bowlby, *Lancet*, 1893, vol. i. p. 1221.

In the discussion on Mr. Kendal Franks' paper, Mr. Bowlby's remarks included statements on the rate of "mortality after operations for strangulated hernia." This statement was commented on in a leading article in the *Lancet* for May 6th, in the following terms: "Mr. Bowlby stated that, taking all the operations for strangulated hernia performed in St. Bartholomew's Hospital during the last ten years, they showed a mortality of 40 per cent. It would be interesting to know to what this very high death-rate is to be ascribed."

Mr. Bowlby's letter of reply to that part of the leader appeared on May 20th, p. 1221 of the *Lancet*.

After reading the reports of the discussion and the letter, I think the following conclusions will be found correct:

First, that the mortality after operations for strangulated hernia, according to Mr. Berry, as quoted by Mr. Bowlby, was, up to 1884, 43 per cent. on 940 cases treated consecutively at St. Thomas', Guy's, and St. Bartholomew's Hospitals, London; secondly, that in 1891 Mr. Treves, as quoted by Mr. Bowlby, gave the mortality at the London Hospital at nearly 50 per cent.; and thirdly, that on further investigation Mr. Bowlby has found that the mortality at St. Bartholomew's for the last ten years was at the rate of 35.82 per cent.

Since the period at which Mr. Bowlby's letter appeared, I have finished

tabulating my operations for hernia, beginning with May, 1866, and ending October, 1892.

The number of cases operated on for strangulated hernia and of which I can obtain notes amounts to 94. These I have arranged into two chief groups, viz., those operated on in pre-antiseptic times, and those operated on with antiseptic precautions. In the latter group there are 44 cases, including 13 deaths, yielding a mortality at the rate of 29½ per cent.

This gives a difference in my favor of 5 per cent.

I imagine that the rate after complete antiseptic operations for strangulated hernia will not be found to vary to any great extent at the several London hospitals. However, the difference between the mortality which obtained before the thorough use of antiseptics, and that which has obtained since the institution of antiseptic or aseptic surgery, is very marked.

My tables include 50 cases operated on in the pre-antiseptic times. The mortality in those cases exceeded 50 per cent., or the rate of mortality ascribed to the practice at the London Hospital by Mr. Treves.

My own personal experience, therefore, shows a reduction of mortality from 50 per cent to 29½ per cent.

It would appear that Mr. Treves, when he described the mortality at the London Hospital as at the rate of 50 per cent., must have included cases operated on without antiseptics.

At St. Bartholomew's the death-rate in the antiseptic period is as high as 35.8 per cent.

I quite agree with Mr. Bowlby when he writes in the letter already alluded to, that "most of the deaths after operations for strangulated hernia are due to exhaustion resulting from compulsory starvation of several days' duration, as well as from continuous retching, vomiting, and pain."

I have analyzed the causes of death in the 13 cases in which the operation for strangulated hernia had been performed antiseptically, and find that 9 deaths occurred from exhaustion from protracted sufferings and old age, that in 3 of these the gut was gangrenous, and that 5 were nearly moribund at the time of operation. None of the other 4 cases died of peritonitis.

An analysis of the causes of death after operation in the pre-antiseptic days, shows that 16 died of peritonitis or exhaustion from protracted sufferings and feeble old age, and 5 from erysipelas or pyæmia.

By operating antiseptically we have practically eliminated peritonitis as a cause of death from operations for strangulated hernia, and we have even got some little distance on the road toward diminishing the number of hopeless cases submitted to hospital surgeons. The good results obtained by antiseptic or aseptic surgery are encouraging patients to submit earlier to an operation which includes a radical cure, and the same good results are encouraging an improving class of general practitioners to

call in the aid of the operating surgeon at a correspondingly earlier date.

The responsibility incurred by the general practitioner when he delays to submit his patient who is suffering from an obstructed hernia, to the operating surgeon, is so great that one wonders at his failing to quickly divest himself of it.

Artificial Anus, and Primary Resection and Suture.—Amongst the 94 cases of strangulated hernia there were 10 cases in which I thought it necessary to make an artificial anus. In each instance the bowel was gangrenous.

A very large proportion, viz., 7, of these occurred in the pre-antiseptic period. In each of these the bowel was in a state of gangrene more or less advanced.

I feel sure that in 4 of these the operation of primary resection and suture could not have been borne, owing to the already exhausted condition of the patients; one died an hour after operation, another two hours after, another twelve hours after, and another survived six days. This last was a woman of eighty years of age, who had been suffering already for nearly a fortnight.

The 3 others in this group of 7 were less unfavorable cases, and I believe that two of them might have borne the operation for primary resection and suture, but that is as much as I could have ventured to predict.

Amongst the 44 cases operated on in the antiseptic period, there were only 3 instances of artificial anus. Not one of these could have borne the prolonged operation of primary resection and suture. The youngest, who had diseased kidneys, sank in eighteen hours after operation, and the other two, who were aged women, succumbed each in a few hours.

It seems remarkable that in the first 50 cases there should have occurred 10 instances requiring artificial anus, and that in the second group of 44 there should have been no more than 3.

If we examine this fact by the light of the chief causes of the condition of the bowel requiring the formation of an artificial anus, we may perhaps find an elucidation of it. The three chief causes of gangrene of bowel in strangulated hernia are, first, acuteness of strangulation; secondly, long duration of the condition before operation; and thirdly, frequent forcible attempts at reduction. The tables cannot be made to throw any light upon the first and third causes, but on the second cause they yield an interesting gleam. In the first 50, the tables show that 28 patients had been suffering for more than two days, and that in the second group of 44 cases the number that had suffered for more than that length of time had dropped down to 19. In the first group 9 had suffered for over four days, whereas in the second group only 5 had so

suffered. I do not say that this is a complete elucidation of the fact I have referred to, but it is sufficient to show that the duration of the strangulation is a powerful factor, though not the only one, in producing the gangrenous state of intestine.

I am conscious that in treating the cases in the second group of 44 I submitted those patients whom I could influence by advice, to operation as early as possible, with the double purpose of arresting the symptoms of strangulation, and of radically curing the hernia.

Primary Resection and Suture.—On reviewing the 13 cases in which I resorted to the formation of an artificial anus, it will be observed that all died, and that I did not attempt primary resection in any case. I cannot forbear, however, from taking this opportunity of expressing my sympathy with those who have been endeavoring to improve the methods of dealing with these desperate cases of gangrenous intestine. The number of instances in which English surgeons have practised primary resection for this condition is very limited, so far as I know. Mr. Kendal Franks' table of 220 cases, supplied with his most interesting and able paper to the Medical and Chirurgical Society of London in March last, contains only a few scattered cases belonging to English surgeons of pre-antiseptic and antiseptic times. The surgeons who have provided the largest group in the table are Kocher, Hagedorn, and Mikulicz, and these together supply some 55 cases. Their results are brilliant. I am quite in accord with those who think that successful primary resection and suture is a preferable operation to the primary formation of an artificial anus, which must be followed by a secondary resection and suture; but I cannot agree with those who would settle this question by the mortality statistics (including cases of pre-antiseptic times) of the respective operations. The cause of failure in the cases of artificial anus, made to relieve strangulated hernia, is not in the operation itself or in its immediate effects, but the causes of death are in the conditions which have preceded and accompanied the gangrene.

Gangrenous intestine is not a condition to be treated by a hard-and fast rule.

One of the first requirements in the consideration of the question of what to do with gangrenous gut is to come to a general understanding of what is meant by gangrenous intestine, for the purpose of the surgeon. For him a portion of bowel which is prospectively dying or dead is gangrenous, though it may not be entirely so or pathologically so. If it is dying and septic, it would be best to treat it by excision and antiseptics. If it is not dying and not septic, then such radical treatment is not called for. Dr. K. Franks thinks that his statistics "show that (*a*) intestinal resection and suture should be the operation of choice in gangrenous hernia, and that (*b*) simple enterotomy followed by artificial anus should

be reserved for absolutely special cases, and should be considered as an exceptional procedure."

This is equivalent to saying that each case must be dealt with on its merits.

On Removing Omentum in Cases of Strangulated Hernia.—I find by my tables that on the total of 94 cases, omentum in greater or smaller quantity had to be dealt with in 35 cases.

In the pre-antiseptic days the mortality in cases in which omentum had been interfered with or removed amounted to 10 out of 15 cases; whereas in the antiseptic period there were 20 cases and only 1 death. In 17 of the 20 cases the omentum had been ligatured and cut away. This shows a marvellous improvement in results.

I am sure that it is wiser to cut off the omentum antiseptically than to run the risk of bruising and even tearing it by pushing it back through a relatively narrow orifice. When in doubt, remove it antiseptically, is, I believe, a good rule.

Should Radical Cure be Attempted in Operations for Radical Hernia?—Among the 44 cases of strangulated hernia operated on antiseptically, I find that in 21 the proceeding was completed by an operation for a radical cure. In 19 the result was entirely satisfactory, the cure being rapid in all cases. In two patients the cure was frustrated by death from a cause overlooked at the time of the operation. One man died from internal strangulation by a band which must have existed concurrently with the hernia, and the other patient succumbed on the thirteenth day, from diarrhœa caused by intra-peritoneal incarceration of small intestine. Peritonitis was not the cause of death in either case.

I would say, that all patients suffering from strangulated hernia should be given the advantage of a radical cure; and I would go farther, and say that all patients suffering from obstructed hernia should be advised to submit to early operation and radical cure.

The 21 cases referred to, include two cases in which the testicle was removed at the same time, one in which the atrophied ovary and Fallopian tube were removed, and several where large masses of omentum were ligatured in segments and cut off.

In treating the tunica vaginalis testis in instances of congenital hernia, I adopted one of two plans: either to make a new tunica by suturing up the portion of the sac attached to the testis, or to trim away the sac close up to the organ. This latter plan gave as good results as the first, and had the merit of economizing time.

Radical Cure of Hernia.—As I have frequently mentioned this subject, perhaps I may be permitted to add a few words with respect to the particular mode of operating of which I have had experience.

I have memoranda of 57 cases in which the radical operation was carried out, 21 of strangulated hernia and 36 of non-strangulated hernia.

I have removed the sac in all cases.

I attached great importance to placing the ligature high up on the neck of the sac. In many cases of inguinal hernia I fastened one loose end of the sac-ligature to the internal oblique and inner pillar of the ring; but I doubted the value of it. In almost all instances of inguinal hernia I brought together the pillars of the ring by sutures, at the same time avoiding any pressure on the constituents of the spermatic cord. I have employed for sutures and ligatures prepared catgut, kangaroo-tail tendon, and silk. I give the preference to silk as more durable and reliable.

In the treatment of the femoral hernia I contented myself with ligature of the sac at its neck and its abscission.

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